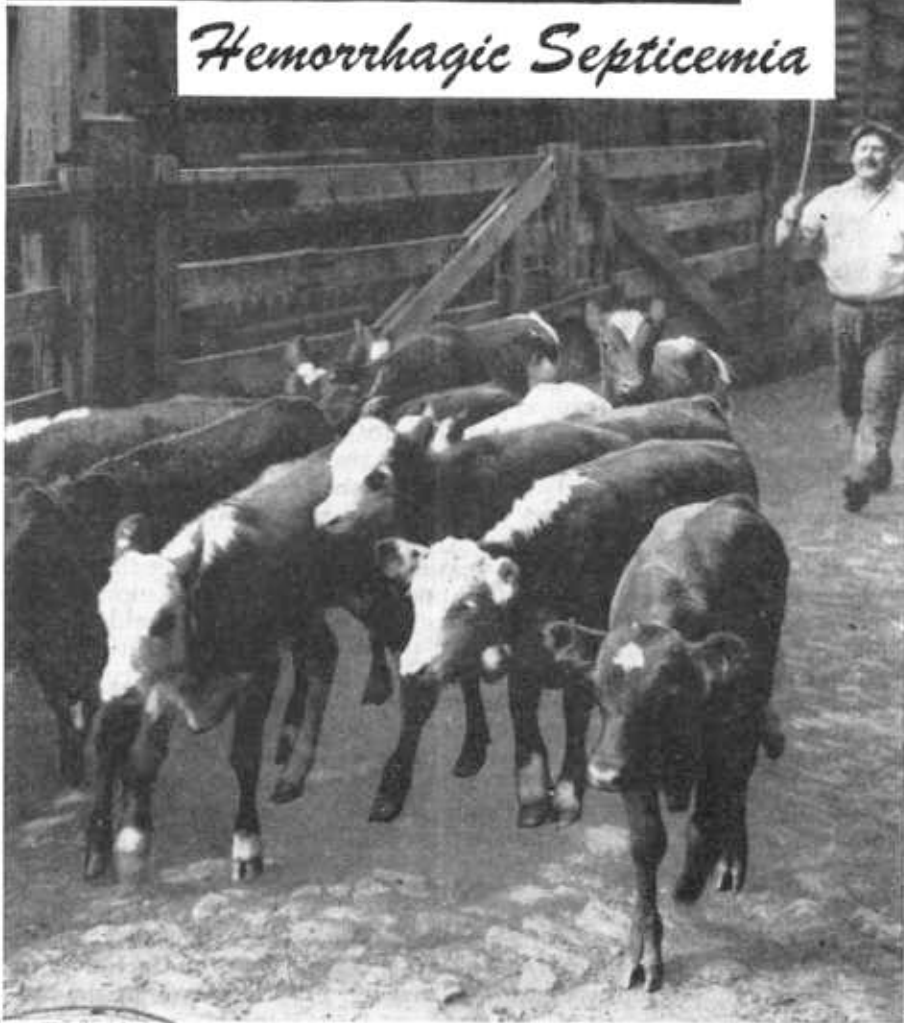


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Shipping Fever of CATTLE -

Hemorrhagic Septicemia



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UNITED STATES DEPARTMENT OF AGRICULTURE

SHIPPING FEVER OF CATTLE

HEMORRHAGIC SEPTICEMIA ¹

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INTRODUCTION

SHIPPING FEVER, also known as stockyard fever, is an infectious disease of cattle and sheep usually resulting in high mortality. It received its medical name, "hemorrhagic septicemia," because hemorrhages in the body tissues and organs of animals dead from the disease are usually an outstanding characteristic, and because it is a septicemia, or poisoning of the blood.

The disease occurs in cattle of all ages in all parts of the United States. Sometimes there are outbreaks in dairy cattle or range cattle in good condition, but losses are greatest among young animals, especially those with lowered resistance. Many outbreaks of shipping fever in cattle are associated with the shipment of animals by rail or truck, and their passage through public stockyards. Range cattle shipped direct to the farm appear to be less subject to the disease than animals that pass through a public stockyard. The vitality of an animal is lowered by the hardships of transit, and its resistance to infection is decreased. The disease is therefore a serious problem to both shippers and receivers of cattle. In some years the losses are heavy, in others light.

It is generally believed that weather conditions influence the prevalence of the disease, since cattle appear to suffer from it most in the fall, winter, and early spring during particularly changeable or inclement weather. After prolonged travel under such conditions, for example, they may arrive on the farm of the purchaser in a run-down condition though they appeared healthy when purchased in the stockyards. Overcrowding, irregularity in feeding and watering, hard driving, lack of rest and proper shelter may reduce the animals' resistance to shipping fever. Shipping calves a short time following weaning or castrating, and branding or dehorning animals just after arrival on the farm may decrease their vitality.

CAUSE

There are two forms of hemorrhagic septicemia. The first, which seldom occurs in cattle, is a septicemia due primarily to infection with the hemorrhagic septicemia organism (fig. 1). This type of the dis-

¹ This is a revision of former editions by H. J. Washburn, now deceased.

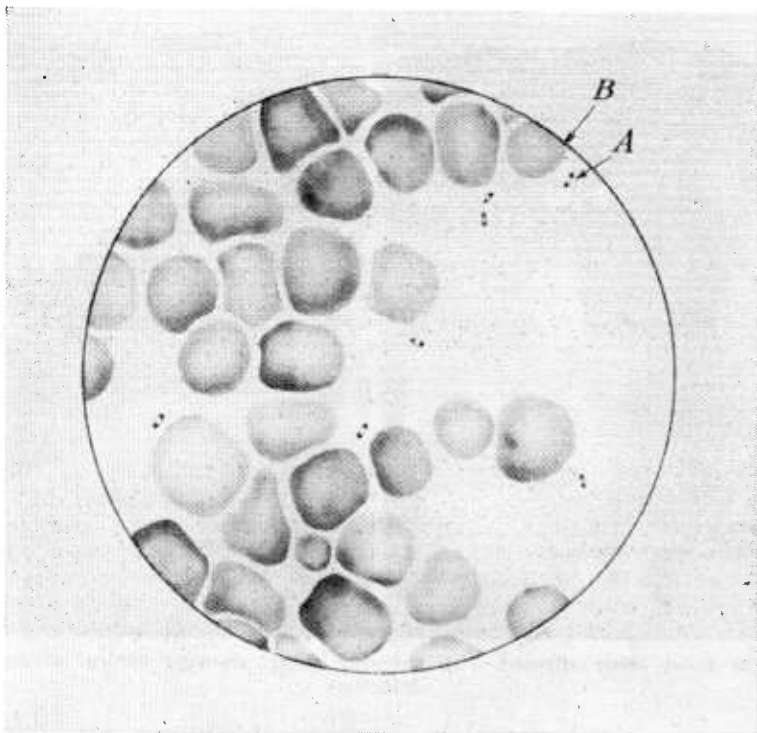


FIGURE 1.—Drawing made from a photomicrograph of blood showing (A) the small, short objects with rounded stained ends, known as hemorrhagic septicemia, or *Pasteurella*, organisms, and (B) the large more or less round objects which are red blood cells.

ease has been encountered in the American bison in the United States and in water buffalo in other countries. The second form of the disease is commonly known as shipping fever, or stockyard fever, and is associated with the shipment of stock, especially cattle and sometimes sheep.

There is a difference of opinion among both practicing veterinarians and research workers as to the primary cause of shipping fever in cattle. Two theories have been advanced, neither of which has been definitely proved. According to one school of thought, the principal causative factor is the hemorrhagic septicemia germ, *Pasteurella boviseptica*. The organism has at times been found in the air passages of normal animals. The theory is that animals harboring these organisms may develop shipping fever when their natural resistance is lowered.

According to the other school of thought, the hemorrhagic septicemia organism probably plays a secondary role, like that of diphtheroids, streptococci, and *B. coli* organisms, and there is another primary infective agent concerned in the production of the disease.

The nature of this agent is not known, but it is thought by some to be a virus. This theory is based principally on the fact that the coexistence of two factors (virus and bacteria) as a causative agent in certain infectious diseases such as swine influenza has long been

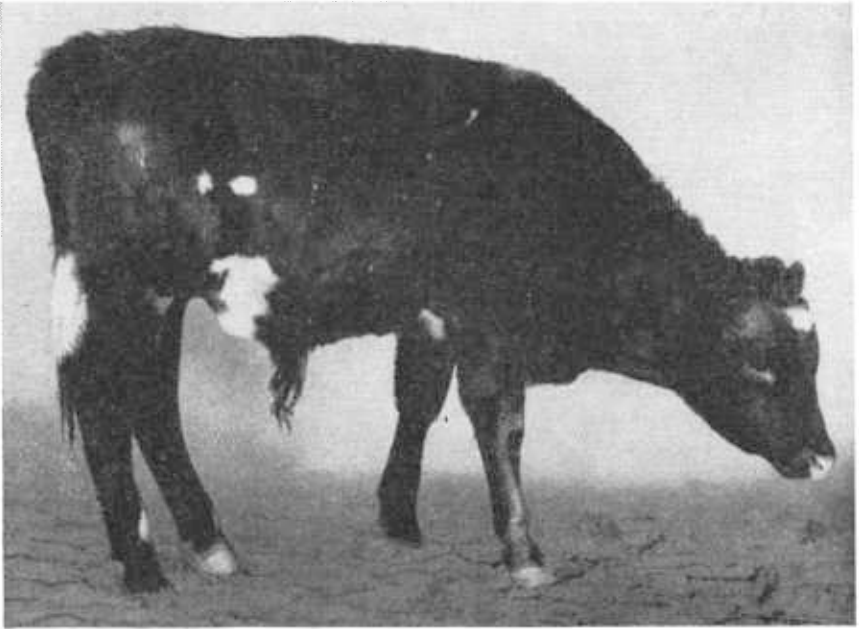


FIGURE 2.—A steer affected with shipping fever, showing typical attitude of dejection.

recognized. Furthermore, the symptoms of shipping fever in many respects resemble those of influenza-type virus diseases in other species.

When cattle reach their destination after a long railroad journey, many of them may show symptoms of shipping fever, especially if they have passed through a public stockyards en route. Local stock that come in contact with these animals often become infected. There may be an outbreak of shipping fever on a farm following a replacement in the dairy herd or introduction of new feeder cattle. Public stockyards, buildings, and other equipment contaminated by affected cattle are a source of danger to other animals that may use these facilities later.

SYMPTOMS

Shipping fever in cattle usually develops very rapidly, lasting from 2 to 8 days or longer. Affected animals first show high fever ranging from 104° to 107° F., dry muzzles, increased respiration, and arched backs, followed by loss of appetite, shivering, muco-purulent discharge from the nose, an occasional hacking cough, distressed breathing, swollen, watery eyes, general depression, gaunt appearance, stiffened gait, and sometimes diarrhea (fig. 2). Within 3 to 5 days after the first symptoms appear, affected animals may develop pneumonia and die in 48 to 72 hours, or the disease may assume a chronic course, the sick animals lingering on for several weeks. In mild attacks, affected animals may recover in a week or two.

During the course of the disease other symptoms may occur. Swelling may appear beneath the skin of the head, throat, or dewlap. These enlargements are somewhat soft and leave a dent on pres-

sure. The tongue is often much swollen, and the animal drools and slobbers because of the irritation of its tongue and throat. There may be difficulty in breathing, depending on the degree of involvement of the air passages and of the lungs. Muscular trembling may be evident. There may be a bloodstained discharge from the nostrils, and strings of mucus may hang from the mouth. Examination of the nostrils often reveals the presence of many small hemorrhages, or blood spots, just beneath their lining membranes.

There is an intestinal form in which the changes take place chiefly in the abdominal cavity. This form may develop after the disease has appeared in the lungs. The stomach, intestines, kidneys, and the lymph glands in such cases become studded with hemorrhages of various sizes, and the intestines become intensely inflamed. Diarrhea sets in, and shreds of mucus and bloody droppings are passed and the animal shows marked weakness and loss of weight. The intestinal form is rare, as most cases show severe involvement of the lungs and the symptoms of croupous pneumonia. Animals may stand with their forelegs wide apart in order to breathe more freely. They lose flesh rapidly, their abdomens become "tucked up," and the eyes quickly become sunken. Sometimes they stagger from extreme weakness.

ANATOMICAL CHANGES

Post mortem examination may reveal the following anatomical changes in an animal dead of hemorrhagic septicemia: Swellings of doughy consistency, containing jellylike material tinged with blood. If these swellings occur in the region of the shoulder or flank, they are sometimes mistaken for blackleg. The lymph glands are enlarged and hemorrhagic. The mucous membranes lining the nose, throat, and air passages of the lungs are inflamed and may contain bloodstained mucus. Hemorrhages may be observed in the fat tissue around the kidneys and in the serous membranes of the internal organs.

When the disease is chiefly in the chest, the lungs are darkened in color and their fibrous tissues are much thickened from the collection of bloody serum in their meshes. There may be solidification of one or more lobes (pneumonia). The diaphragm, heart sac, and heart walls show numerous bloody points and larger collections of blood.

In the intestinal form, there are hemorrhages into the intestines and sloughing of the lining of the intestinal wall. As a result the intestinal contents are wrapped in a bloody mucus.

In acute forms the animals may die suddenly, before such changes develop, but bacteriological examination of the body fluids may reveal hemorrhagic septicemia organisms.

DIAGNOSIS

Because of its similarity to certain other disease conditions in cattle, shipping fever is often difficult to diagnose. However, when animals that have been recently shipped develop symptoms suggestive of the disease, shipping fever should be suspected. Owing to its acute course, high fever, and rapid termination, the disease may be mistaken for anthrax, malignant edema, or blackleg. A bacteriologic

examination which includes both cultural tests and inoculation of laboratory animals is sometimes necessary to diagnose the disease.

Other conditions in cattle, such as coccidiosis, cornstalk disease, lead poisoning, and sweetclover and other forms of vegetable poisoning may be mistaken for shipping fever. In an outbreak of suspected shipping fever the diagnosis, treatment, and control should be left to an experienced veterinarian.

CONTROL AND PREVENTION

In considering measures for the control and prevention of this disease it is important to remember that shipping fever is the most serious of a group of cattle maladies which commonly result from mishandling, neglect, or exposure of animals in transit or shortly after their arrival at their destination. Suggestions for reduction of losses due to shipping fever and other diseases of cattle incident to shipping will be found in the following summary of recommendations published in U. S. Department of Agriculture Leaflet No. 38, **Maintaining the Health of Livestock in Transit**:

1. Avoid hard driving.
2. Before loading animals at the loading pens, they should first be rested, then fed hay to which they are accustomed, and finally watered.
3. Avoid rough handling in loading and overcrowding cattle in the cars.
4. In cold weather, provide plenty of bedding in the car and in severe weather, protect the cattle by lining the side walls of the car with heavy paper.
5. Feed and water at proper intervals en route and allow animals to become well rested when unloaded for feed and water.
6. The common practice of withholding water until animals are very thirsty and thus increasing the tendency to take on a heavy fill is harmful and should be avoided.

The same attention should be given to shipments of stocker and feeder cattle from public markets back to the country.

The vitality of such cattle on arrival may be considerably reduced owing to the hardships of travel and they should receive special attention:

1. Provide adequate dry shelter in cold weather, especially if it is wet and stormy.
2. Segregate the animals that appear to be off condition, keep them quiet, place in warm dry quarters, and feed lightly.
3. On arrival give animals access to dry roughage, such as timothy hay, prairie hay, or corn stover for a few hours and then water, but not all they will drink.
4. If they are to be pasture-fed, allow animals to become accustomed to new grasses by permitting only a few hours' grazing each day.
5. If they are intended for dry-lot feeding with no pasture available, feed corn fodder and hay for 10 days or longer before starting them on fattening rations.

USE OF IMMUNIZING AGENTS

Although the hemorrhagic septicemia organism is generally recognized as the primary and specific causal agent in one form of hemorrhagic septicemia usually not associated with shipping, the cause of the shipping fever form of the disease has not been definitely established. However, on the basis that this organism is associated with both forms of the disease, either as a primary agent or as a complicating secondary factor, biological products (bacterins and antisera) prepared with the hemorrhagic septicemia organism are frequently used in the prevention and control of the disease. Under experimental conditions these products have shown a satisfactory degree of efficacy.

Bacterins increase the animal's resistance to infection. It is generally believed that they produce an active immunity of long duration, which is established in 10 days to 2 weeks following vaccination. For this reason, feeder and stocker cattle or other animals that are to be shipped should be treated with bacterins at least 10 days to 2 weeks before shipment. The use of bacterins on animals in transit or in stockyards has not proved successful.

On the other hand, the administration of anti-hemorrhagic-septicemia serum in doses of 50 cubic centimeters is believed to produce an immediate increase in resistance to the disease. The resistance lasts only a few weeks so it should be given only a few days before animals are shipped. As an added precaution, the serum may again be administered after the animals arrive at their destination, particularly if some of them show symptoms of the disease.

A condition called anaphylaxis (shock or severe reaction) may sometimes follow the administration of an immunizing agent. To avoid this, only homologous antiserum, that is, serum obtained from bovine species, should be used on cattle, and bacterin should be free from toxic products. The advisability of using biological products and the method of administration should be left to a veterinarian.

TREATMENT

In most cases medicinal treatment of fully established shipping fever is of little value. In visibly sick animals, especially during the early stages of the disease, the administration of large doses of anti-hemorrhagic-septicemia serum (one or two injections of 100 to 150 cubic centimeters or more) will frequently assist in bringing about recovery.

The sick animals should be kept quiet, placed in warm, dry, well ventilated quarters, fed a light nourishing ration, and have access to fresh drinking water. All animals that are apparently free of the disease should be removed from those showing symptoms and placed in separate, noninfected quarters. If new cases develop among them in a few days after their removal, the healthy animals remaining should be removed again to another locality. In that way unaffected animals can be kept out of danger of further contamination.

Reports from stockmen who have treated several thousands of cattle with sodium bicarbonate show that this treatment had little effect in increasing the animals' resistance to shipping fever.

Although the Bureau of Animal Industry has conducted no experiments to determine the merits of sulfonamide compounds such as sulfanilamide, sulfathiazole, sulfapyridine, sulfamethazine, and sulfamerazine, and antibiotics such as penicillin, streptomycin, aureomycin, terramycin, and chloromycetin in the treatment of shipping fever, clinical reports from veterinarians in the field indicate that these preparations may have considerable therapeutic value if properly administered during the early stages of the disease. Treatment of affected animals with any of the above-mentioned preparations should be under the direct supervision of a veterinarian.

DISINFECTION OF PREMISES

Since shipping fever is an infectious disease, the carcasses of animals that have died of it should be burned or buried. All stables, sheds, or yards that have contained infected animals should be cleaned and disinfected. The interior of the stables, especially the mangers and manure trenches, should be washed with a disinfectant, such as compound cresol solution, 4 ounces to a gallon of water, or carbolic acid, 6 ounces to a gallon of water. The best way to apply disinfectant solutions is with a spray pump, such as is used in spraying orchard trees. Further information on the use of disinfectants on the farm may be found in *Farmers' Bulletin No. 1991*.

All refuse and material from the stable and barnyard should be removed to a place not accessible to cattle or sheep. Manure should be spread on fields and plowed under. Open fields or pastures are cleansed rapidly by the action of sunlight.